

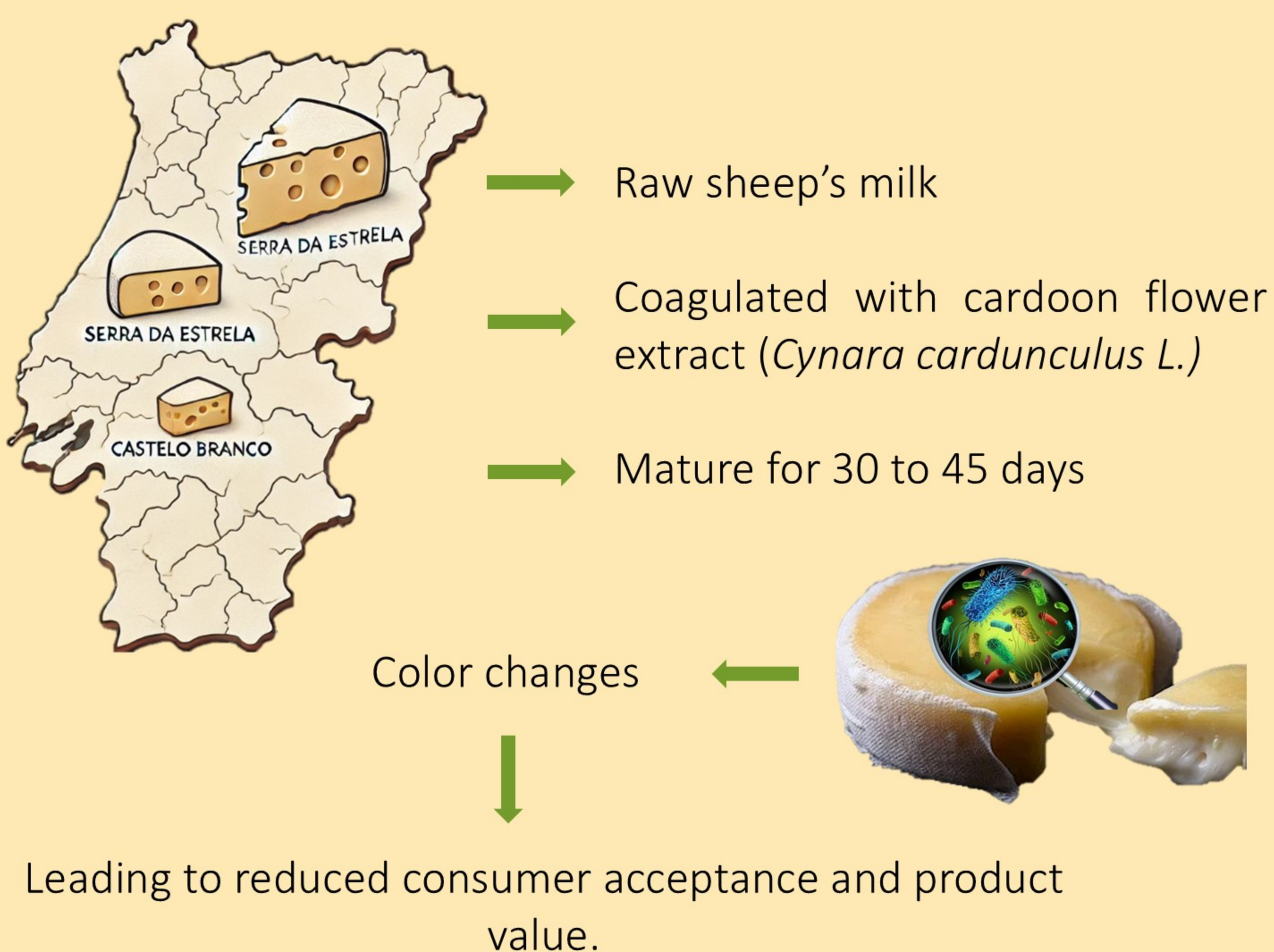
# Microorganisms that enhance defects on the surface of cheeses from Castelo Branco and Serra da Estrela: an incidence study

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## Introduction

Portugal, especially its interior regions, boasts an assortment of traditional food products with significant cultural and economic value, particularly cheeses having Protected Designation of Origin (PDO) status, such as Castelo Branco and Serra da Estrela cheeses.



## Materials and Methods

Samples from 15 cheseemaking facilities

Suspended in sodium citrate  
Diluted in Ringer's solution

PPA → Penicillin and Pimaricin  
Agar

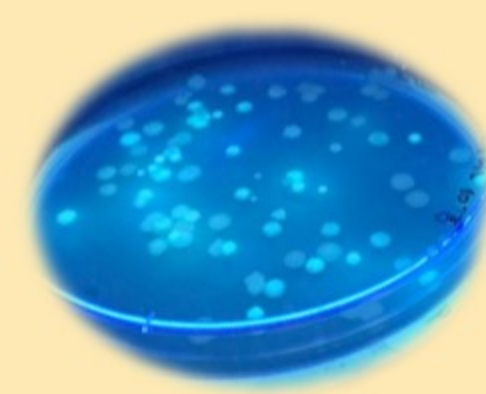
PCA → Plate Count Agar

DRBC → Dichloran Rose  
Bengal Chlortetracycline Agar

Mesophilic aerobic bactéria

Mould and Yeast Counts

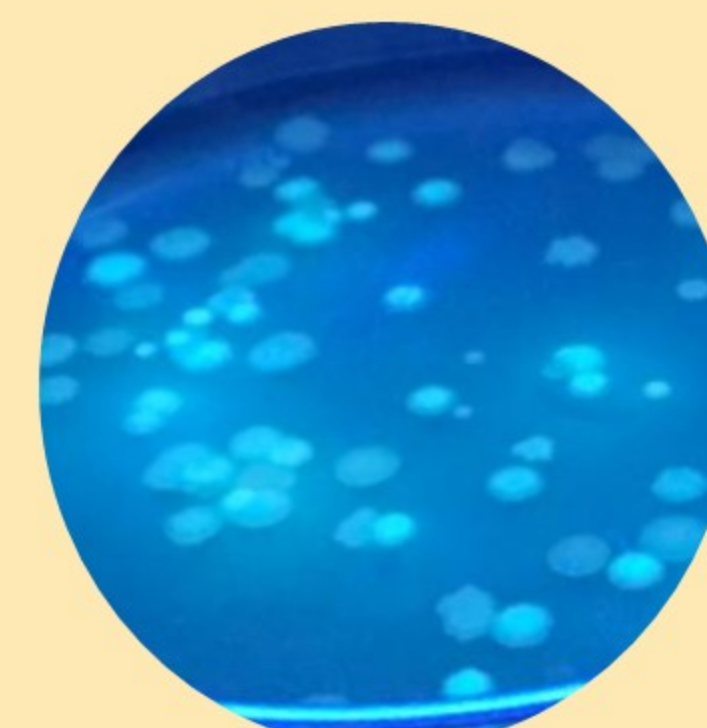
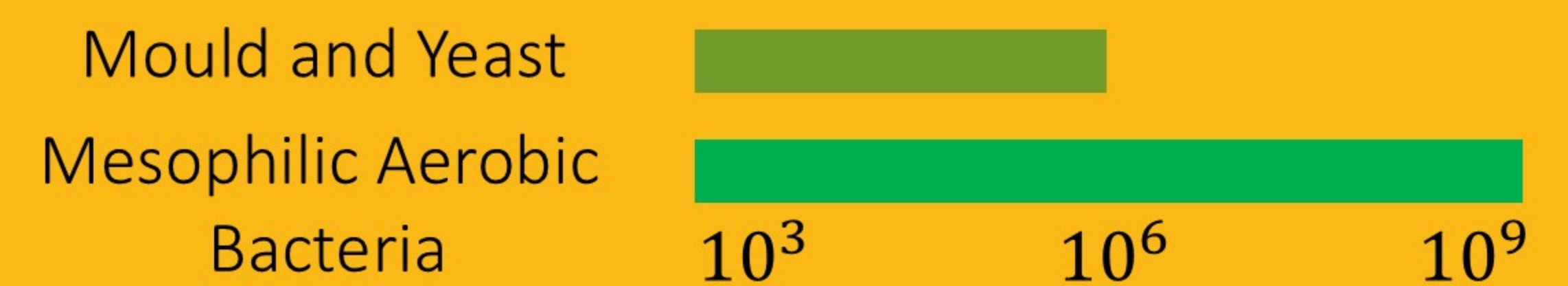
Tests:



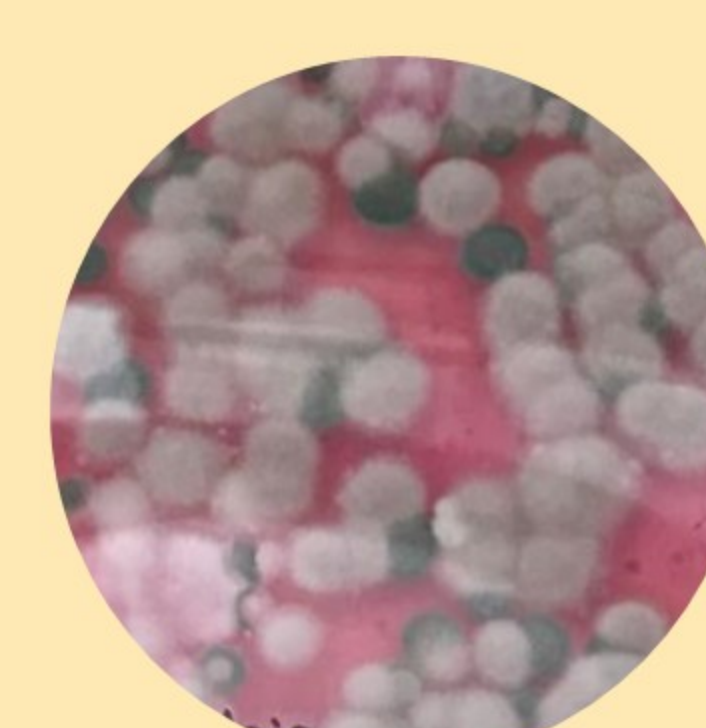
## Results



Averaged Counts in UFC/g



Meio PPA



Meio DRBC



Meio PPA

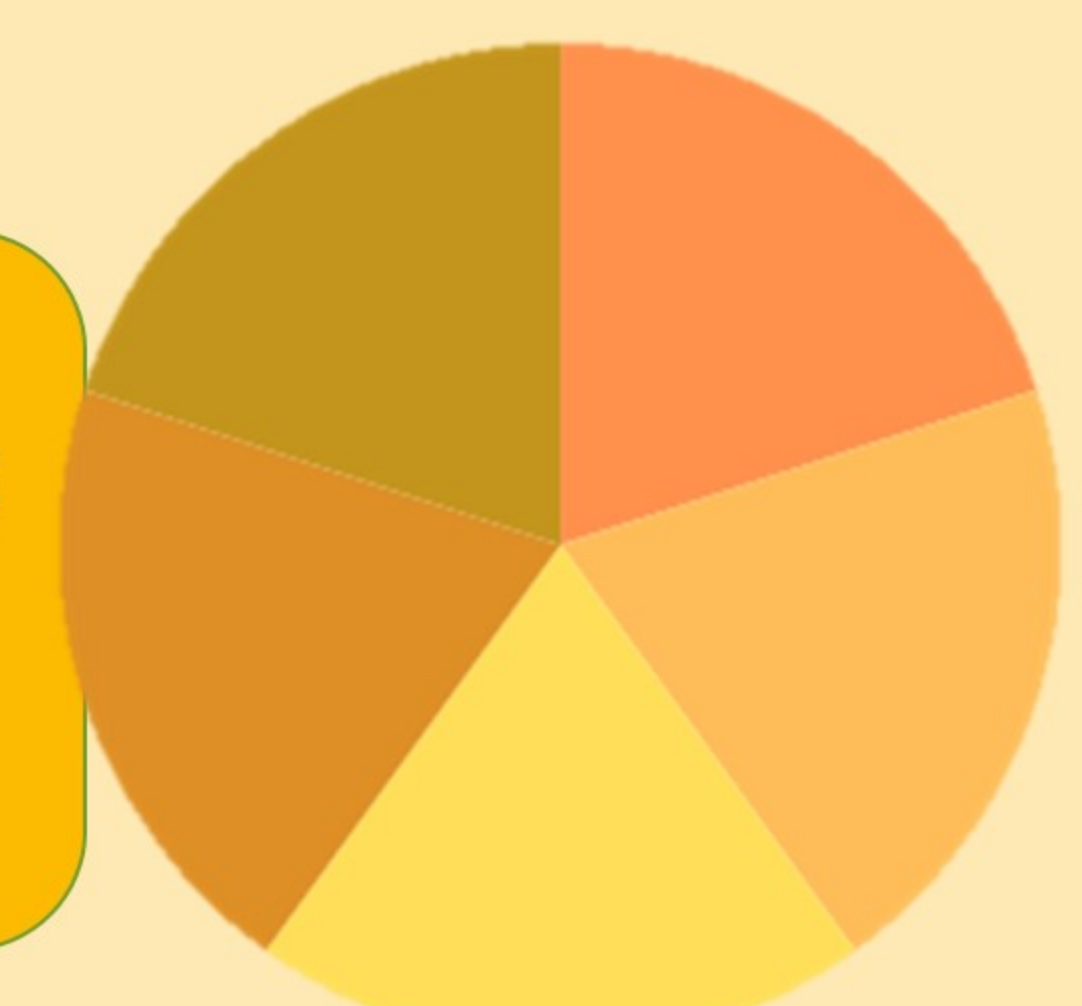
Pyoverdine

Pyocyanin

Pyorubrin

The occurrence of microorganisms of *Pseudomonas* genus was confirmed, with their presence on the surface of the cheeses being responsible for colouring

Identification using Sanger sequencing of PCR derived amplicons of protein-encoding genes considered useful for multilocus sequence analysis (gyrB and rpoD) (>98% Identity)



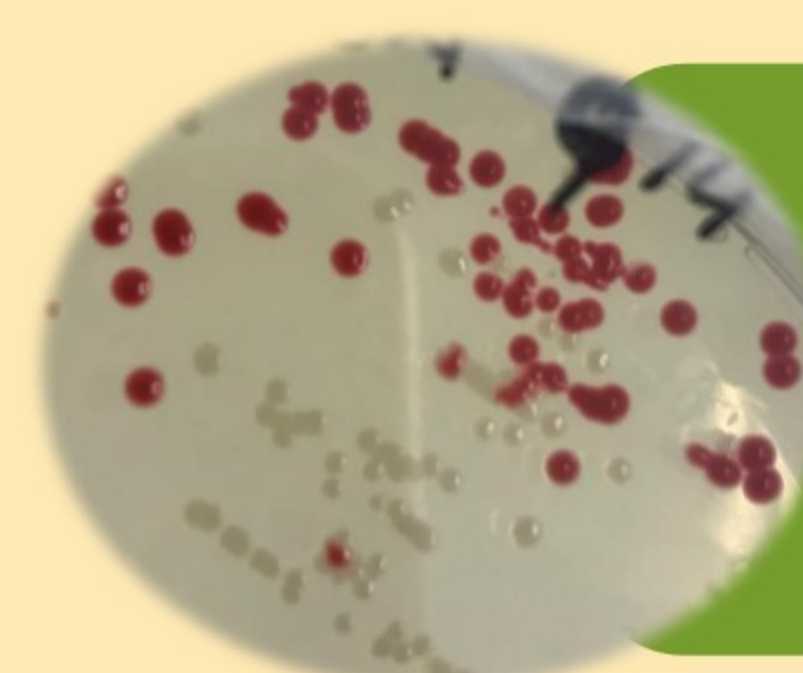
*P. fluorescens*

*P. fragi*

*P. bubulae*

*P. lundensis*

*P. shahriarae*



*Serratia marcescens*, producing the pigment prodigiosin, confirmed by API 20 E (97.7%) and 16S DNA Sanger sequencing (99.76% certainty).

## Conclusion

Effective control of the cheese production process is crucial to prevent microbial contamination and discoloration. The findings from this study, part of Activity 3.1 of the Interreg TID4AGRO Project, will be essential in mapping these microorganisms and developing strategies with producers to reduce economic losses.

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